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ABSTRACT

Nonverbal context is important in the language acquisition process. The present study compares different amounts and ordering of pictorial context with respect to their effect on learning word-referent relations in a second language. Twenty-five monolingual English-speaking high school students were shown twenty Spanish sentences and pictures of the event to which each sentence referred. The sentences and the pictures were broken down into four components: an agent, an object, and an instrument (the arguments), plus an activity (the predicate). The subjects heard these components before and after each sentence. The number of pictures shown with each sentence varied. The predicate was placed after the arguments in half of the component presentations and before the arguments in the rest. The subjects were asked to translate each sentence after the second repetition. Results indicated that as the number of unknown referents decreased, the probability increased of correctly inferring the meaning of the unknown word or words from the context. Also, subjects were able to use context more effectively when the predicate illustration was presented after the argument illustrations. These findings confirmed the hypothesis that there is an optimal level at which nonverbal context facilitates the process of inferring word meanings in a foreign language. It is suggested that the results have implications for immersion programs. (Author/AMH)

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EXPLOITING NONVERBAL CONTEXT TO PROMOTE THE ACQUISITION OF WORD-REFERENT RELATIONS IN A SECOND LANGUAGE

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EXPLOITING NONVERBAL CONTEXT TO PROMOTE THE ACQUISITION OF WORD-REFERENT RELATIONS IN A SECOND LANGUAGE

While it is now widely accepted that the use of nonverbal context is basic to first-language acquisition, little is known about how systematically to exploit this fact in the second language acquisition process. The present study addresses this issue experimentally by comparing different amounts and ordering of pictorial context with respect to their effect on learning word-referent relations in a second language.

According to Stalnaker, a philosopher of language, communication normally takes place when speaker and audience share a background of beliefs or assumptions. He calls this concept of common background belief, pragmatic presupposition. The foreign language learner who finds himself or herself in the total immersion situation must rely on presuppositions as well. For the second language learner, even the most basic level of presuppositions, word-referent relations, cannot be taken for granted. Before the learner can have command of the language, he or she must find out what each foreign word means or presupposes by itself. Using de Saussure's terminology, the learner must make a connection between a linguistic sign and a concept.

We wanted to explore the circumstances under which this connection might be facilitated by manipulating the actual referential context in which a second language was presented. We did this by using pictorial

context to expose English monolingual high school students to Spanish.

In a natural situation, the foreign language learner will often be exposed to a complete sentence referring to an ongoing event. If none of the words in the sentence is already known, the learner has little means for inferring which word refers to which element of the event. The ideal conditions, then, for learning new vocabulary from a sentence uttered in its nonverbal referential context would seem to be when the referents of all words but one are already known to the language learner at the time he or she hears the complete sentence. Under these conditions, the learner can infer that the one unknown word goes with the one situational element not otherwise being referred to. At this point, there are enough word-referent relations that can be taken for granted so that the meaning of a new word can be successfully communicated. It was therefore hypothesized that the smaller the number of unknown referents at the time a subject is exposed to a sentence in its referential context, the higher the probability of correctly inferring the meaning of the unknown word or words from a pictorial context.

In the basic experimental task, subjects were exposed to twenty Spanish sentences and a picture of the event to which the sentence refers. The subjects' task is to determine what each Spanish word in the sentence means. Both the sentence and the picture are broken down into four components: three entities and a relation. Greenfield and Smith state that entities are things that can be pointed at. Relations, however, are actions or states that can predicated of entities but which cannot be pointed at. In these sentences, the entities are composed of the following arguments: an agent, object, and instrument. The relation

is a predicate which takes the form of an activity.

The ideal condition to acquire word referent relations is in the one unknown condition when the predicate is presented last. Using as an example the sentence: "La niña pinta la cerca con la brocha" (The girl paints the fence with the paintbrush), the experimenter says "la niña" and shows the subject illustration 1. "La cerca" is uttered next while showing illustration 2 and illustration 3 accompanies "la brocha". "Pinta" is the last word presented and no picture is shown. Lastly, the full sentence (La niña pinta la cerca con la brocha) is presented together with illustration 4. The subject then translates each word as it is presented to him. In this example the order is: La niña, pinta, la cerca, la brocha.

This basic idea yielded a design in which sentences are presented to each subject in a total of 10 different conditions. Table 1 shows this breakdown. There are five different levels of pictorial context. All of the individual arguments and the predicate are presented verbally before being combined into a sentence; what varies from condition to condition is the number of verbal elements that are introduced with a pictorial illustration. For example, in the four unknown referents case, all the components are presented without any illustrations. Only when the sentence is uttered is a picture shown. In the 3 unknowns case a picture is shown with one of the components and the sentence only. As you can see in Table 1, there are four sentences in each of the five context conditions. It is assumed that where a word is stated without a pictorial illustration, it will be an unknown word at the time the complete sentence is presented. Thus, we have the variable, number of unknowns which we also refer to as amount of context.

The second variable is whether the subject is presented the predicate before the arguments or after the arguments. Each subject gets ten sentences in the former condition and ten are in the latter. As it was mentioned earlier, all sentences used in the experiment referred to events composed of an agent, object, and instrument (the arguments) plus an activity (the predicate). Because a predicate has no existence in itself but only in relation to some argument, it is impossible to use a picture or any visual image to convey the meaning of a verb without including an entity undergoing or performing the verb's activity. Consequently, a language learner hearing a verb accompanied by an illustrative picture may be led to the incorrect conclusion that the word refers to some more concrete, pointable entity pictured as involved with the activity, rather than to the activity itself. For this reason, it was predicted that subjects would be able to use context more effectively when the predicate illustration was presented after the argument illustrations, rather than vice versa.

Method

A total of 25 high school students participated in the experiment. All were monolingual English speakers who had never taken any foreign language classes.

The basic materials were twenty sentences in Spanish which referred to twenty sets of pictures described earlier. The latter were taken from Janice Laine's language assessment test which was developed at UCLA. They were composed of an agent, object, and instrument (the arguments), plus an activity (the predicate).

Each subject was interviewed individually. The following instructions were given:

> There will be twenty trials. In each one I will be saying four words in Spanish. I will then repeat these words within the structure of a sentence. Sometimes I will show you a picture at the same time that I say the word. I will always show you a picture with the sentence. After each of these presentations, I will ask you to translate each of the four Spanish words into English.

The subject was given two practice trials to make sure that he or she understood.

The subjects' translations were written down and scored later.

Results

Figure 1 shows the overall results. Subjects gave more correct translations the fewer the unknowns.

A repeated measures analysis of variance was performed on the scores in order to ascertain how much of the variance in the scores was due to the effects of the predicate being presented first or last, the number of components accompanied by a picture and the subjects themselves. The summary of the analysis is in Table 2.

The results show that there are main effects of the position of the predicate and the amount of context. The interaction between these two variables is also significant.

As it can be seen in Figure 2, subjects translated more Spanish words correctly when the predicate was presented last than when it was presented first. This can be seen by comparing the height of the two lines. Also, this figure shows that, as the number of unknown referents decreases, performance improves in both conditions. This can be seen in the upward slope of the lines from left to right.

Aside from overall performance, a key issue is whether the subjects were able to infer the correct translations of the Spanish words which were not initially introduced with a picture. Figure 3 is a graph of the percentage of correct translations of Spanish words whose meaning had to be inferred from the activity picture which accompanied the whole sentence. When the predicate was presented first, the percentage ranged from 12.5% to 26.0%. When it was presented last, they ranged from 29.5% to 68.0%. In both cases, the greatest number of correct inferences occurred in the one unknown referent condition, as predicated. However, within the one-unknown condition, the greatest number of correct inferences were made when the predicate was presented last; just as predicted.

Thus, the results strongly confirm our hypothesis that the ideal condition for using nonverbal context to infer the meaning of an unknown word in a language learning situation is where the word in question is the only verbal element in the sentence whose meaning is unknown. We also find confirmation for the idea that using nonverbal context to present the meaning of a verb is most effective when the meanings of the relevant noun arguments have already been made known.

Discussion

The results from this study indicate some variables that control the effectiveness of nonverbal context in the second language learning process. Nonverbal context can be used to establish the presuppositions that are likely to be lacking when people try to communicate while speaking different languages.

In establishing these presuppositions, this study points to the

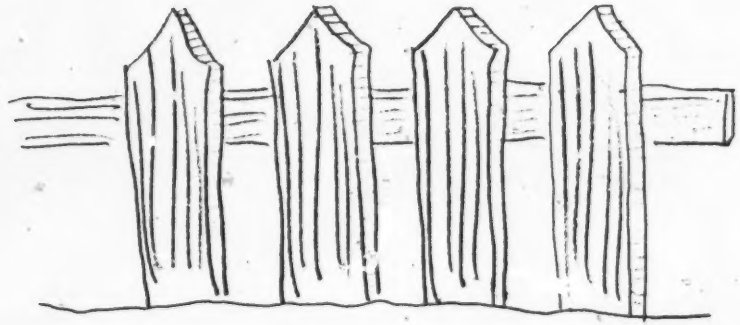
inherent differences between entities expressed as nouns, and relations, expressed as verbs. A noun can acquire meaning for the learner on its own merit. It represents a thing, and as such, its referent can be pointed at, touched, made obvious. A relation, expressed by a verb, does not have these characteristics. The referent of a verb can be observed only when entities are interacting in such a way that the relation emerges. We cannot touch the activity of painting. We must see a person (the agent) holding a brush (the instrument) doing "something" to a fence (the object).

Because relations depend on entities in this way, the referent of an unknwon verb cannot be pictured in isolation and can easily be confounded with one of the entities of which it is predicated. For this reason, saying an unknown verb in a relevant pictorial context leaves its meaning indeterminate if the learner cannot eliminate, through previous knowledge, pictured entities as possible referents for the new word. The predicate first condition was designed to maximize this indeterminacy and this order did indeed reduce the learning of Spanish vocabulary in our experiment.

Our findings have implications for immersion methods of teaching a second language, in which no translation to the first language is provided by the teacher. In so far as immersion consists of the teacher producing sentences in their nonverbal referential contexts for the learner to comprehend, our study points to some principles for making such exposure fruitful for second language acquisition. The first is that exposure to a sentence in a foreign language will lead to greater learning of new word-referent relations if the component

word-referent relations have first been presented separately. The second principle is that sentences uttered in their nonverbal referential contexts are likely to lead to correct inferences about the referents of totally unknown words if there is but one unknown word in a given sentence. Finally, verb meanings can be more effectively taught through nonverbal context if the learner is already familiar with the linguistic expression of the arguments to which the verb is related in that situation. Our findings indicate that, no matter how rich the nonverbal context, little vocabulary learning can be expected if second language learners are simply immersed in sentences without first building up component word-referent relations in a systematic way.

I



II

III

IV

Table 1. Number of Sentences in Each Condition

	4 unknown referents	3 unknown referents	2 unknown referents	1 unknown referent	0 unknown referents
Predicate first	2	2	2	2	2
Predicate last	2	2	2	2	2

Table 2. Results of the Analysis of Variance

Source of Variance	SS	d.f.	MS	F	probability
Position of the Predicate	158.41	1	158.41	84.26	$p < .001$
Subjects	369.34	24	15.39		
Position of the Predicate X Subjects	45.09	24	1.88		
Amount of Context	256.38	4	64.1	21.58	$p < .001$
Amount of Context X Subjects	258.02	96	2.97		
Position of the Predicate X Amount of Context	28.69	4	7.17	4.57	$p < .01$
Position of the Predicate X Amount of Context X Subjects	150.31	96	1.57		
TOTAL	1293.24	249			

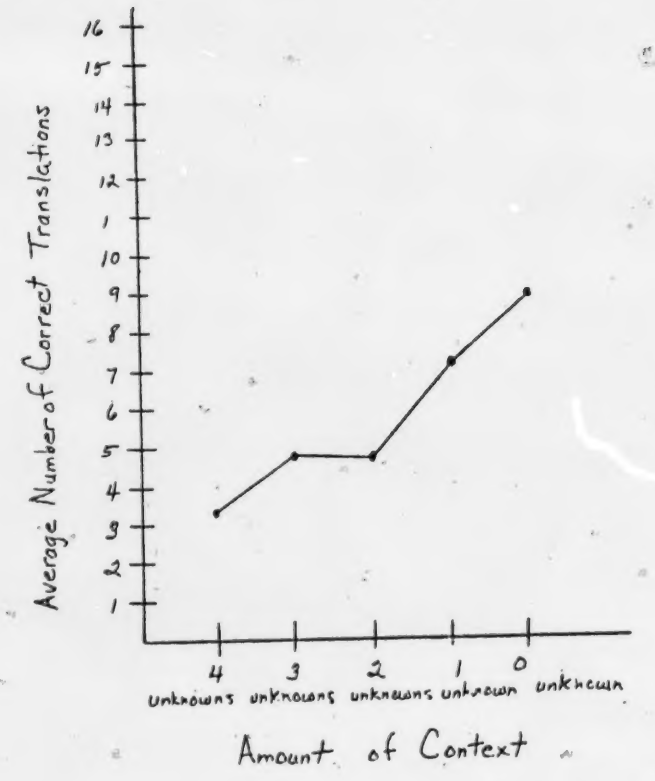


Figure 1. Average Number of Correct Translations in Each of the Context Conditions

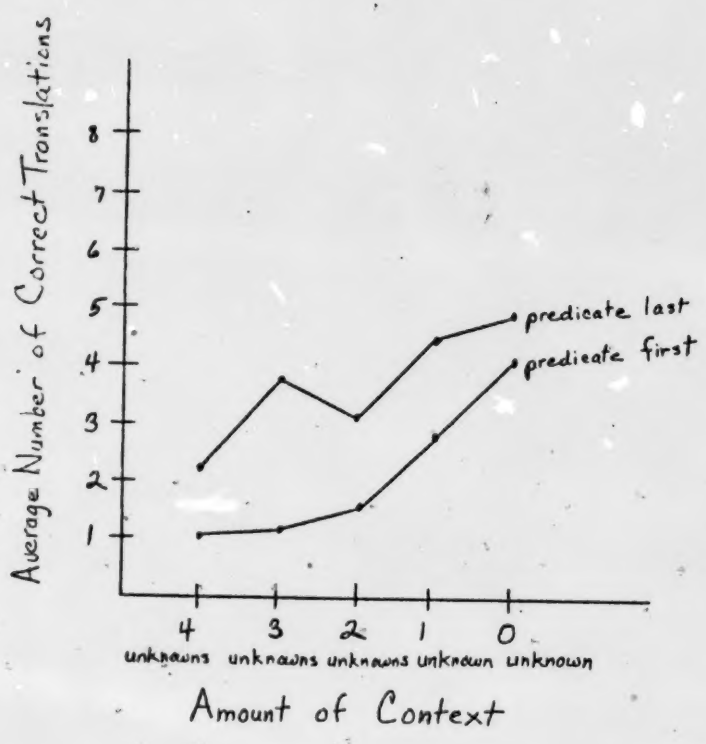


Figure 2. Interaction Between the Position of the Predicate and the Amount of Context

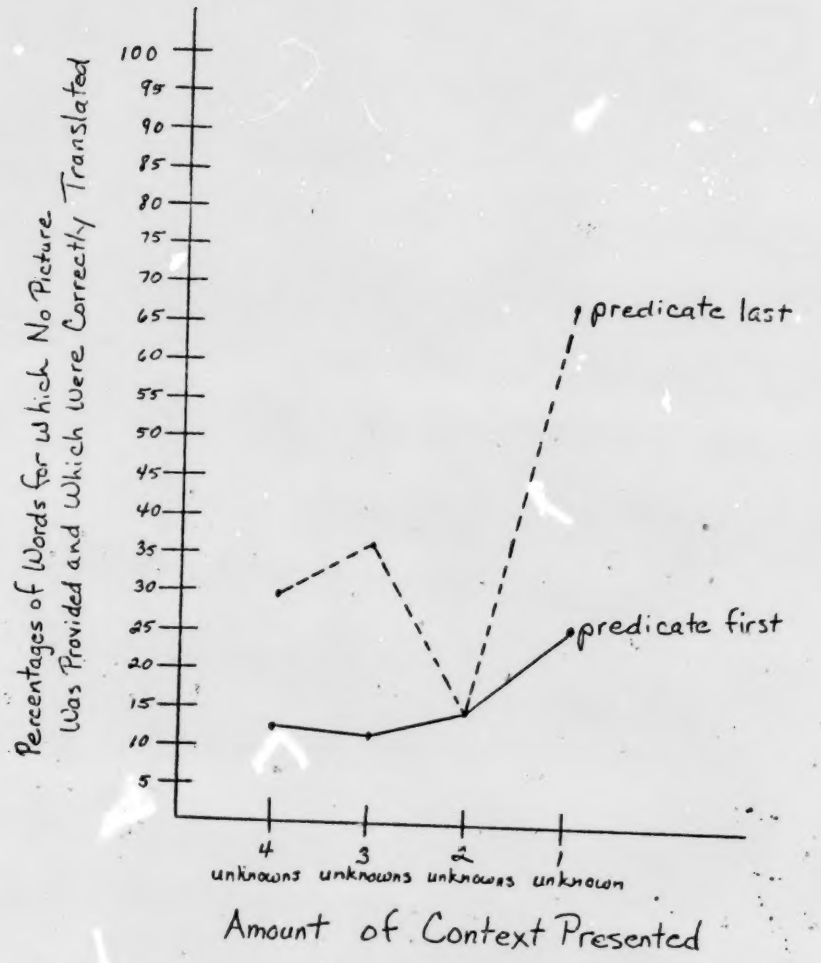


Figure 3. Percentage of Correct Translations of Spanish Words Whose Meaning Needed To Be Inferred As A Function of the Amount of Visual Context Presented